



## CFPN trial

# Measuring response of tef to nitrogen (N) fertigation to determine optimum application level



When

Winter 2015-16 (in pots)  
Summer 2016 (in field)



Crop

Tef (*Eragrostis tef*) cv. 405B and 406W



Soil type

Perlite, sandy loam loess



Where

Plastic-covered tunnel and  
open field at Gilat Research Center,  
Negev, Israel



Measurements

Dry matter production  
Nutrients uptake

## Objective

To measure the response of tef to increasing N in irrigation water, to determine at which N level tef performance is at optimum and to test the feasibility of growing tef in the hot, arid conditions of the Northern Negev Desert, Israel.

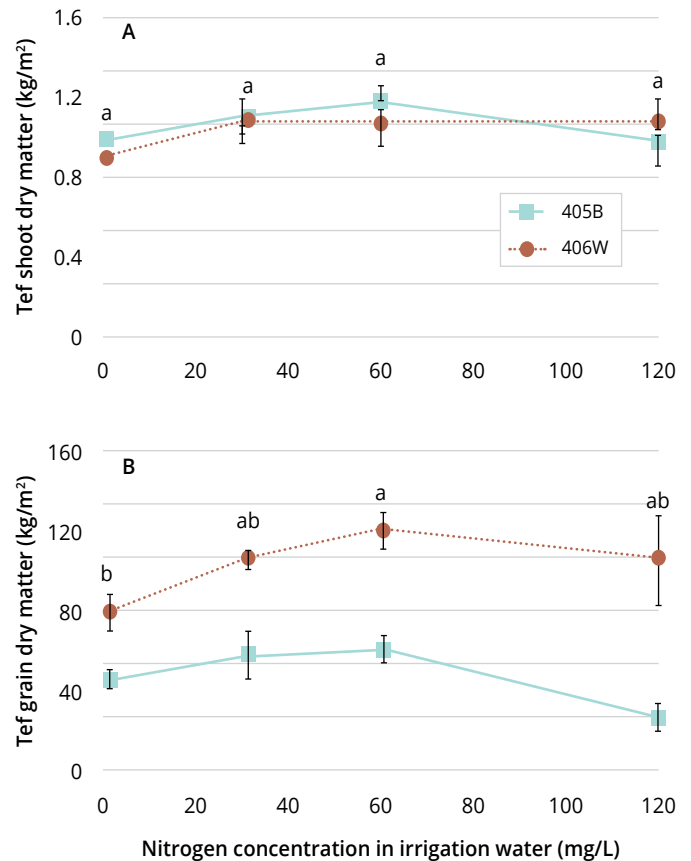
## Treatments

1) 3L pots experiment: there were five treatments of N in the irrigation solution (10, 20, 40, 80 and 120 mg/L) applied as 90%  $\text{NO}_3^-$  and 10%  $\text{NH}_4^+$ .

2) Field experiment: there were four treatments of N in the irrigation solution (0, 30, 60 and 120 mg/L) applied as 70%  $\text{NO}_3^-$  and 30%  $\text{NH}_4^+$  (to adjust the pH in the soil).

## Results

- Optimum N level in fertigation is 40-80 mg/L
- Inadequate N fertilizer caused a decrease in overall plant growth, whereas excess N fertilizer caused an increase in vegetative growth at the expense of grain yield
- K uptake increased alongside increased N availability, emphasizing the need for balanced fertilization in tef
- Tef response to N in the field was consistent with that recorded in pots
- Low soil pH is a major limitation for tef cultivation in the Northern Negev. Changes in genotype and cultivation practices are suggested in order to overcome this limitation



Shoot (A) and grain (B) dry matter in the summer field experiment by N fertigation level for two tef genotypes 405B and 406W. Different letters represent significant (<0.05) differences for both main effects.

## Further reading

Gashu, K.; Halpern, M.; Zipori, I.; Bustan, A.; Saranga, Y.; Yermiyahu, U. Tef (*Eragrostis tef* Trotter) Responses to Nitrogen Fertigation under Semi-Arid Mediterranean Climate. *Agronomy* 2020, 10, 1870. <https://doi.org/10.3390/agronomy10121870>



Response of tef leaves to different N fertilizer rates. N10–N120 indicates the concentration of N in irrigation solution (10–120 mg/L) in increasing order from left to right.